

NATIONAL WEATHER SERVICE INSTRUCTION 10-320

July 16, 2004

Operations and Services

Marine and Coastal Weather Services Program, NWSPD 10-3

COASTAL/LAKESHORE FLOOD SERVICES

NOTICE: This publication is available at: <http://www.nws.noaa.gov/directives/>.

OPR: OS21 (T. Schott)

Certified by: OS21 (T. Pierce)

Type of Issuance: Emergency

SUMMARY OF REVISIONS: To bring this directive into phase with the entire suite of 10-3 Procedural Instructions, an emergency update was performed. This directive supersedes NWSI 10-320 dated December 16, 2003.

The following changes were made:

- a. (4.5) High Surf Advisories are no longer issued using Marine Weather Statements, per agreement reached with Region Program Managers in November 2003.
- b. (Appendix A) We added an additional example (both segmented and non-segmented) of a High Surf Advisory with the Coastal Flood Statement.

Signed

July 2, 2004

Gregory A. Mandt
Director, Office of Climate,
Water, and Weather Services

Date

Coastal/Lakeshore Flood Services

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Appendix

A. Examples of NWS Coastal/Lakeshore Flood Products A-1

1. Mission Connection. Coastal/Lakeshore Flood Statements, Watches and Warnings provide the public with detailed information on significant coastal/lakeshore flood events. Coastal/lakeshore flooding affects land-based and near shore interests along much of the United States coastline.

Coastal/lakeshore flooding events include storm surge, high astronomical tide, and seiche (on the Great Lakes). See National Weather Service Instruction (NWSI) 10-301 for these definitions.

2. Issuance Guidelines.

2.1 Creation Software. Weather Forecast Offices (WFO) should use Watch/Warning/Advisory (WWA) software or other watch/warning/advisory software to issue coastal flood products.

2.2 Issuance Criteria. Coastal/Lakeshore flood products are issued to provide the general public and shoreline interests with detailed information on coastal/lakeshore flood events. WFOs with Great Lakes or Coastal Waters Forecast areas of responsibility (see NWSI 10-302) issue Coastal/Lakeshore flood products.

2.2.1 This directive addresses two types of flooding:

- a. **Coastal Flooding.** The inundation of land areas by oceanic or sea water over and above normal tidal action. This flooding may impact the immediate oceanfront, gulfs, bays, back bays, sounds, tidal portions of river mouths and inland tidal waterways.
- b. **Lakeshore Flooding.** The inundation of land areas along any of the Great Lakes over and above normal lake levels. This flooding may impact the immediate lakefront, bays, and interfaces between the Great Lakes and connecting waterways, such as rivers.

2.2.2 Coastal/lakeshore flooding intensities range from minor water overflow, with little or no damage, to significant water overflow, with extensive inundation and severe beach erosion. Coastal flooding is highly dependent on local coastline topography and nearshore bathymetry. WFOs with marine responsibilities should maintain records of previous coastal flood events and benchmark data (e.g., tide datum, storm summaries with pertinent observations, and a description of the synoptic situation, etc.) to respond to potential flooding episodes.

2.2.3 WFOs with coastal/lakeshore flood responsibility will coordinate closely with adjacent WFOs and, when appropriate, the responsible River Forecast Center (RFC). Coordination with the RFC ensures product consistency when the combined effects of river discharge and storm surge or tidal piling affect river outlets to increase the severity of coastal/lakeshore flooding. See section 4.4 for the relationship between WFO Coastal Flood products and tropical cyclone products.

2.3 Issuance Time. Coastal/lakeshore flood products are non-scheduled, event-driven products.

2.4 Valid Time. Coastal/lakeshore flood products are valid from the time of release or specified time until canceled, updated, replaced, or until the product's expiration time.

2.5 Universal Geographic Code (UGC). Coastal/lakeshore flood products will contain land-based, areal UGC codes.

3. Technical Description. AWIPS Product Category CFW is used for all three coastal/lakeshore flood products: watch, warning, and statement.

3.1 Coastal/Lakeshore Flood Watch/Warning (AWIPS Product Category CFW).

3.1.1 Functions.

- a. A “COASTAL/LAKESHORE FLOOD WATCH” informs the public coastal/lakeshore flooding is possible. A watch should be issued 12 to 36 hours in advance.
- b. A “COASTAL/LAKESHORE FLOOD WARNING” informs the public coastal/lakeshore flooding, posing a serious threat to life and property, is occurring, imminent, or highly likely in the first forecast period (first 12 hours).

WFOs may issue warnings valid after the first forecast period when a strong likelihood of the event exists or when a longer advance notice is needed for public response.

3.1.2 Contents. Coastal/Lakeshore Flood Watches and Warnings will include:

- a. The expiration time in the communications header.
- b. The phrase “BULLETIN - IMMEDIATE BROADCAST REQUESTED” as the Mass News Disseminator Broadcast Line, immediately above the Product Type Line.
- c. The definition of a Coastal/Lakeshore Flood Watch/Warning (i.e., A LAKESHORE FLOOD WARNING MEANS FLOODING AND BEACH EROSION WILL OCCUR.)
- d. For a warning, an indication of the severity of the flooding including expected water levels in either inches or feet and tenths, but not both. This may be given with reference to low water normals or recent averages. WFOs may use general terms regarding beach erosion, associated weather, and wave heights. WFOs may include location-specific information as reported to the NWS by emergency management officials. For more significant events the forecaster may reference a previous well-known (historical) high water event.

3.2 Coastal/Lakeshore Flood Statement (AWIPS Product Category CFW).

3.2.1 Functions

- a. Coastal/Lakeshore Flood Statements keep the public updated on existing watches and warnings with supplemental information, including updated observations and impact information. Statements should be issued at least every 6 hours after

watches and warnings are in effect. Statements issued to routinely update an existing watch or warning will include information similar to that in the original product (see Section 3.1). The headline(s) will include the same information as in the watch or warning and will note that the watch or warning continues to be in effect, such as:

...A COASTAL FLOOD WATCH REMAINS IN EFFECT UNTIL 3 AM THURSDAY FOR THE ENTIRE TEXAS COAST SOUTH OF GALVESTON...

- b. Coastal/Lakeshore Flood Statements cancel a watch or warning, remove areas from a watch or warning, or announce the expiration of a warning, such as:

...A COASTAL FLOOD WATCH CONTINUES IN EFFECT UNTIL 3 AM THURSDAY FOR THE TEXAS COAST SOUTH OF CORPUS CHRISTI...

...A COASTAL FLOOD WATCH FOR THE TEXAS COAST FROM CORPUS CHRISTI TO GALVESTON HAS BEEN CANCELLED...

- c. Coastal/Lakeshore Flood Statements address less severe coastal/lakeshore flooding events.
- d. Coastal Flood Statements direct users to a Hurricane Local Statement. See the Tropical Cyclone discussion in Section 4.4.

3.2.2 Contents. Coastal/Lakeshore Flood Statements will include:

- a. The expiration time in the communications header. If a Statement is issued with the intent of clearing all zones from a previously issued watch or warning, then the Statement expiration time is normally one hour after the Statement issuance time.
- b. Information on the location, areal coverage, severity, and expected duration of the event.

3.3 Format. CFWs use the following product format. WFOs should segment CFWs based on common weather conditions. For more detailed product format information consult NWSI 10-1701, *Text Product Formats and Codes*.

This product is available in industry standard encoding and languages, and may include, but not limited to, American Standard Code for Information Interchange, Extensible Markup Language, Wireless Markup Language and HyperText Markup Language.

(WMO HEADER) (ISSUANCE DATE TIME)
(AWIPS IDENTIFIER)
(AREAL UGC CODES[S])-(EXPIRATION TIME)-

BULLETIN - IMMEDIATE BROADCAST REQUESTED (for watches and warnings)
(COASTAL FLOOD STATEMENT, WATCH, or WARNING) or (LAKESHORE FLOOD
STATEMENT, WATCH, or WARNING)
NATIONAL WEATHER SERVICE (CITY) (STATE)
(VALID TIME) AM/PM (LOCAL TIME)(DAY)(DATE)

...HEADLINE (If needed)...

NARRATIVE TEXT

\$\$ (required)

FORECASTER NAME (Optional)

4. Consistency with other NWS Products. Forecasters must coordinate and ensure consistency among products within their WFO, neighboring WFOs, RFC, and the National Centers. For example:

4.1 Zone, Coastal, and Nearshore Forecasts. Coastal/Lakeshore Flood Watches/Warnings must be headlined in associated public zone forecasts. Coastal/Lakeshore Flood Watches/Warnings may be referenced in associated coastal/nearshore forecasts.

4.2 Hazardous Weather Outlook (AWIPS Product HWO). The HWO provides the public, media, and emergency managers with early notice of potentially hazardous conditions. Coastal flood events may be included in the HWO, but periodic event updates must be made using the CFW (Coastal Flood Statement, Watch, or Warning) product. Some Regions issue the Special Weather Statement (SPS) as an outlook product. See NWSI 10-517 for details on the HWO and SPS.

4.3 Short Term Forecast (AWIPS Product NOW). The Short Term Forecast provides users with a plain language description of current and short-term weather and flooding conditions for the County Warning Area (CWA) of a WFO. To comply with the intention of the product, coastal flood information in the Short Term Forecast will be as brief as possible. Therefore, the Short Term Forecast augments, but **does** not replace, the Coastal Flood Statement and its more specific details. See NWSI 10-517 for details on the NOW.

4.4 Hurricane Local Statement (AWIPS Product HLS). Coastal flooding may occur at great distances from the center of a tropical cyclone. In situations where tropical cyclone watches/warnings have not been issued by the respective Tropical Cyclone Prediction Center for the CWA, the WFO will use the CFW product suite to address coastal flooding.

However, with the closer approach of a tropical cyclone, tropical cyclone watches/warnings may be issued by the Tropical Cyclone Prediction Center for the CWA. In these situations, the WFO commences issuance of the Hurricane Local Statement (HLS). CFW products will no longer be issued by the WFO after the issuance of the first HLS.

In the event an existing CFW product will be superseded by a tropical cyclone watch or warning, the WFO should issue a final Coastal Flood Statement—prior to the release of the first WFO-issued HLS—directing users to the HLS as the comprehensive WFO product detailing storm effects, including coastal flooding.

Tropical cyclones generate any combination of storm surge, coastal flooding, or high surf. See NWSI 10-601, *Tropical Cyclone Products*, for additional coordination guidance for these situations.

4.5 High Surf Advisory. High surf may be characterized by observations specific to a geographical area, such as large waves breaking in the surf zone with sufficient energy to erode beaches, move large logs, wash over jetties or exposed rocks, etc. High Surf Advisories are issued with Coastal Flood Statements (CFW). High Surf Advisories may remain in effect concurrent with the issuance of a Coastal Flood Watch (CFW). High Surf Advisories are not issued for the Great Lakes. High Surf Advisories should be headlined in the Surf Zone Forecast (SRF).

5. Water Level Observations and Dissemination.

5.1 Tidal Observations. Real-time access of a WFO to accurate water-level data is especially important during times of exceptionally high tide. WFOs should maintain close contact with officials in coastal communities having access to, and interest in, water-level data augmenting official gauging systems/networks. Forecasters should be familiar with terminology associated with tide measurements. Many of these definitions are provided in NWSI 10-301.

The National Ocean Service (NOS) collects and distributes real-time tidal observations and predictions.

The NOS Center for Operational Oceanographic Products and Services web site includes Physical Oceanographic Real Time System and Predictions with current tidal observations and daily high and low water tide predictions for tidal reference stations. The web site is:

<http://www.co-ops.nos.noaa.gov/>

5.2 NWS Tide Reports. Some WFOs issue routine tide reports, while other offices only issue tide reports on an as-needed basis during significant coastal events. Most tide reports are issued using the AWIPS product identifier TID.

Reference tide reports to standard datums used by the NOS. For most areas the reference tidal datum is Mean Lower Low Water (MLLW).

5.3 Great Lakes Water Levels. Data for lake water levels are available from the Army Corps of Engineers and the NOS.

5.4 NWS Great Lakes Water Level Report. Some WFOs disseminate periodic water level reports, while other offices only issue reports on an as-needed basis. Water level reports are issued using the AWIPS product identifier OMR.

APPENDIX A - Examples of NWS Coastal/Lakeshore Flood Products

1. Examples of Coastal/Lakeshore Flood Watches
2. Examples of Coastal/Lakeshore Flood Warnings
3. Examples of Coastal/Lakeshore Flood Statements
4. Example Tide Report
5. Example Great Lakes Water Level Report

1. Examples of Coastal/Lakeshore Flood Watches

Example Lakeshore Flood Watch

WHUS61 KGRR 260845
CFWGRR
MIZ037-043-050-056-064-071-077-261500-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
LAKESHORE FLOOD WATCH
NATIONAL WEATHER SERVICE GRAND RAPIDS MI
445 AM EDT FRI OCT 26 2001

...LAKESHORE FLOOD WATCH TODAY ALONG THE LAKE MICHIGAN COAST FROM
THE INDIANA/MICHIGAN BORDER TO MANISTEE...

A DEEPENING LOW PRESSURE SYSTEM IN WESTERN QUEBEC WILL AFFECT
LAKE MICHIGAN TODAY. CURRENTLY WINDS ARE GUSTING TO 30 MPH AND
WAVES RANGE FROM 4 TO 6 FEET. HOWEVER... BY THIS AFTERNOON WINDS
ARE EXPECTED TO GUST TO 60 MPH AND WAVES MAY INCREASE UP TO 18
FEET.

REMEMBER...A LAKESHORE FLOOD WATCH MEANS LAKESHORE FLOODING IS
POSSIBLE. PEOPLE ALONG THE LAKE MICHIGAN SHORELINE SHOULD BE
READY TO MOVE TO SAFE GROUND AND TAKE ACTION IF FLOODING OCCURS
OR IF WARNINGS ARE ISSUED. MINOR FLOODING HAS ALREADY BEEN
REPORTED NEAR BIG SABLE POINT. LISTEN TO LOCAL
RADIO...TELEVISION...OR NOAA WEATHER RADIO FOR FURTHER
INFORMATION.

WARNINGS WILL BE ISSUED IMMEDIATELY AS CONDITIONS WARRANT. THE
NEXT SCHEDULED STATEMENT ON THIS POTENTIAL FLOODING EVENT WILL BE
ISSUED AROUND 11 AM.

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Example Coastal Flood Watch

WHUS41 KOKX 300719
CFWOKX
CTZ009-NYZ071>077-301700-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
COASTAL FLOOD WATCH
NATIONAL WEATHER SERVICE NEW YORK NY
320 AM EDT SUN SEP 30 2001

...COASTAL FLOOD WATCH ISSUED FOR TONIGHT...

THE NATIONAL WEATHER SERVICE HAS ISSUED A COASTAL FLOOD WATCH FOR PEOPLE LIVING ALONG THE SHORES OF NEW YORK CITY...COASTAL WESTCHESTER...COASTAL FAIRFIELD AND COASTAL NASSAU COUNTIES FOR TONIGHT'S HIGH TIDES.

A LARGE AREA OF HIGH PRESSURE EXTENDING FROM THE GREAT LAKES NORTHEAST ACROSS NEW ENGLAND AND AN INTENSIFYING LOW PRESSURE SYSTEM OFF THE MID ATLANTIC COAST WILL PROLONG THE STRONG NORTHEAST WINDS THAT DEVELOPED DURING EARLY SATURDAY. NORTHEAST GALES BLOWING ACROSS A LARGE DISTANCE OR FETCH WILL PILE WATER ALONG THE COAST TODAY AND TONIGHT.

MINOR TIDAL FLOODING IS FORECAST THIS MORNING FOR MOST SHORES BORDERING LONG ISLAND SOUND AND THE ATLANTIC OCEAN. FOR LONG ISLAND SOUND...TIDAL DEPARTURES WILL RANGE FROM AROUND 1.5 FEET ABOVE NORMAL AT NEW LONDON CT TO 2.5 FEET ABOVE NORMAL AT KINGS POINT NY. FOR THE ATLANTIC SHORES...TIDAL DEPARTURES WILL RANGE FROM AROUND 1.5 FEET ABOVE NORMAL AT MONTAUK POINT TO 2.1 FEET ABOVE NORMAL AT SANDY HOOK NJ. MODERATE TIDAL FLOODING IS POSSIBLE IN ISOLATED AREAS SUCH AS FREEPORT NY.

MODERATE TIDAL FLOODING MAY OCCUR ACROSS SEVERAL AREAS DURING TONIGHT'S HIGH TIDES BEFORE MIDNIGHT. FOR LONG ISLAND SOUND...TIDAL DEPARTURES WILL RANGE FROM AROUND 2 FEET ABOVE NORMAL AT NEW LONDON CT TO AROUND 3 FEET ABOVE NORMAL AT STAMFORD CT AND KINGS POINT NY. FOR THE ATLANTIC SHORES...TIDAL DEPARTURES WILL RANGE FROM AROUND 1.5 FEET ABOVE NORMAL AT MONTAUK POINT TO AROUND 3 FEET ABOVE NORMAL AT SANDY HOOK NJ.

AS THE LOW MOVES WELL OFFSHORE...WINDS WILL SHIFT TO THE NORTHWEST ON MONDAY...WHICH WILL CAUSE TIDAL DEPARTURES TO RECEDE BACK TO MORE NORMAL LEVELS.

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BELOW ARE TIMES OF HIGH TIDE AND FORECAST HEIGHTS FOR SELECTED LOCATIONS...

LOCATION	TIME	ASTRONOMICAL TIDE LVL (MLLW)	MINOR FLOODING BEGINS (MLLW)	MODERATE FLOODING BEGINS (MLLW)	FORECAST HEIGHT (MLLW)
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TODAY...

THE BATTERY NY	750 AM	4.8 FT	6.7 FT	8.0 FT	6.7 FT
FREEPORT NY	736 AM	3.2 FT	5.2 FT	5.9 FT	5.4 FT
KINGS POINT NY	1115 AM	7.7 FT		10.5 FT	10.2 FT
STAMFORD CT	1043 AM	7.6 FT	9.5 FT	11.1 FT	10.0 FT
BRIDGEPORT CT	1041 AM	7.1 FT	8.9 FT	10.4 FT	9.2 FT

TONIGHT...

THE BATTERY NY	803 PM	5.1 FT	6.7 FT	8.0 FT	7.7 FT
FREEPORT NY	823 PM	3.4 FT	5.2 FT	5.9 FT	5.9 FT
KINGS POINT NY	1132 PM	7.6 FT		10.5 FT	10.7 FT
STAMFORD CT	1101 PM	7.6 FT	9.5 FT	11.1 FT	10.5 FT
BRIDGEPORT CT	1059 PM	7.1 FT	8.9 FT	10.4 FT	9.7 FT

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2. Examples of Coastal/Lakeshore Flood Warnings

Example Lakeshore Flood Warning

WHUS61 KBUF 121501
CFWBUF
NYZ010-019-122100-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
LAKESHORE FLOOD WARNING
NATIONAL WEATHER SERVICE BUFFALO NY
1000 AM EST TUE DEC 12 2000

...WARNING...LAKESHORE FLOODING ALONG LAKE ERIE FROM DUNKIRK TO
BUFFALO NEW YORK THROUGH THIS EVENING...

A STRONG STORM SYSTEM IS PRODUCING SUSTAINED WESTERLY WINDS OF UP
TO 60 MILES AN HOUR OVER LAKE ERIE THIS MORNING. THESE WINDS ARE
PILING WATER UP OVER THE EASTERN END OF THE LAKE WITH WATER
LEVELS JUST OVER 5 FEET ABOVE NORMAL AT SUNRISE. THESE MAY RISE
TO OVER 8 FEET ABOVE NORMAL BY THIS AFTERNOON.

A LAKESHORE FLOOD WARNING MEANS THAT FLOODING AND BEACH EROSION WILL OCCUR. SOME LAKESHORE FLOODING HAS ALREADY BEEN REPORTED NEAR EVANGOLA STATE PARK. VISITORS SHOULD STAY AWAY FROM THAT LOCALE AND ANY OTHER FLOODED AREAS. COASTAL RESIDENTS...ESPECIALLY THOSE FROM SILVER CREEK TO ANGOLA ON THE LAKE...SHOULD BE ALERT AND BE PREPARED MOVE AWAY FROM THE BEACH.

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Example Lakeshore Flood Warning - Emphasis on Erosion

WHUS61 KLOT 051837
CFWLOT
INZ001>003-060015-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
LAKESHORE FLOOD WARNING
NATIONAL WEATHER SERVICE CHICAGO IL
1235 PM CST SAT NOV 5 2005

...LAKESHORE FLOOD WARNING TONIGHT AND SUNDAY FOR THE SOUTHERN LAKE MICHIGAN SHORE FROM GARY TO NEW BUFFALO...

VERY STRONG NORTH WINDS WILL DEVELOP OVER THE REGION TONIGHT AND CONTINUE INTO SUNDAY AFTERNOON. SUSTAINED WINDS OF 50 TO 60 MPH DOWN MUCH OF THE LENGTH OF LAKE MICHIGAN WILL GENERATE WAVES UP TO 15 FEET ON THE SOUTH END OF THE LAKE BY DAYBREAK SUNDAY. THE SUSTAINED WINDS WILL ALSO RAISE THE AVERAGE WATER LEVEL ON SOUTHERN LAKE MICHIGAN BY ABOUT 2 FEET. THESE LARGE WAVES...ON TOP OF THE WATER LEVEL RISE...WILL CAUSE FLOODING AND BEACH EROSION ALONG PARTS OF THE LAKE MICHIGAN SHORELINE BETWEEN GARY AND NEW BUFFALO.

A LAKESHORE FLOOD WARNING MEANS LAKESHORE FLOODING AND BEACH EROSION ARE IMMINENT.

IF YOU LIVE...WORK OR HAVE INTERESTS ALONG THE SOUTHERN LAKE MICHIGAN SHORE FROM GARY TO NEW BUFFALO...YOU SHOULD PREPARE FOR THESE HIGH WINDS AND WAVES NOW. BEACH EROSION AND DAMAGE TO UNPROTECTED VESSELS AND STRUCTURES IS LIKELY.

STAY AWAY FROM PIERS....BREAK WALLS...UNPROTECTED DOCKS AND SHORELINE. ALL WILL BE HAZARDOUS PLACES DURING THE HIGH WINDS AND WAVES.

THE STRONG WINDS WILL BE GENERATED BY A POTENT FALL STORM SYSTEM. THE LOW PRESSURE WILL MOVE NORTHEAST FROM CENTRAL KENTUCKY TO WESTERN OHIO THIS AFTERNOON...AND CONTINUE NORTH THROUGH THE EASTERN GREAT LAKES TONIGHT AND INTO EASTERN ONTARIO BY SUNDAY MORNING.

A LAKESHORE FLOOD STATEMENT WILL BE ISSUED AROUND 600 PM CST THIS EVENING WITH THE LATEST INFORMATION ON THIS STORM SYSTEM AND THE LAKESHORE FLOODING AND BEACH EROSION SITUATION.

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Example Lakeshore Flood Warning - Seiche Emphasis

ARBCFWMQT
TTAA00 KMQT 102015
MIZ006-102315-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
LAKESHORE FLOOD WARNING
NATIONAL WEATHER SERVICE MARQUETTE MI
415 PM EDT THU APR 10 2003

...LAKESHORE FLOOD WARNING FOR MUNISING BAY SHORELINE AND
ADJACENT LAKE SUPERIOR SHORELINE THROUGH 715 PM EDT...

EARLIER THIS AFTERNOON...A LINE OF SEVERE THUNDERSTORMS WITH WIND GUSTS TO 120 MPH HAD MOVED ACROSS LAKE SUPERIOR. STANNARD ROCK LIGHTHOUSE AT 145 PM EDT REPORTED A WIND GUST TO 120 MPH AS THIS LINE OF SEVERE THUNDERSTORMS MOVED THROUGH AND THE EASTERN LAKE SUPERIOR BUOY HAD A WIND GUST TO 90 MPH AT 2 PM EDT. THIS LINE OF THUNDERSTORMS HAS CAUSED AN EIGHT FOOT HIGH WALL OF WATER TO PILE UP AGAINST THE CANADIAN SHORELINE OF NORTHEASTERN LAKE SUPERIOR. AT 330 PM EDT...A GAGE MONITORING LAKE WATER LEVELS AT MARQUETTE HAD DROPPED 6 FEET BELOW THE NORMAL VALUE OF 601 FEET. AT 330 PM EDT...THE LAKESHORE GAGE AT WHITEFISH POINT HAD DROPPED 5 FEET BELOW THE NORMAL VALUE OF 601 FEET. AT 340 PM EDT...THE ALGER COUNTY SHERIFF REPORTED THAT MUNISING BAY HAD BEEN COMPLETELY DRAINED OF WATER. THE EIGHT FOOT WALL OF WATER AGAINST THE CANADIAN SHORELINE OF NORTHEASTERN LAKE SUPERIOR WILL RECEDE AND WILL CAUSE RAPID FLUCTUATIONS IN WATER LEVELS ALONG THE EASTERN LAKE SUPERIOR SHORELINE. THIS RAPID FLUCTUATION OF WATER LEVELS WILL BE MAGNIFIED AT MUNISING BAY. A WAVE AS HIGH AS 20 FEET WILL MOVE INTO MUNISING BAY FROM LAKE SUPERIOR AS THE WATER RECEDES FROM THE CANADIAN SHORELINE OF NORTHEASTERN LAKE SUPERIOR. THIS WAVE AND SUBSEQUENT SMALLER WAVES WILL CAUSE SIGNIFICANT FLOODING AND DAMAGE OF PROPERTY ALONG THE SHORELINE OF MUNISING BAY. WATER LEVELS SHOULD RETURN TO NORMAL BY 715 PM EDT.

RESIDENTS IN MUNISING SHOULD EVACUATE IMMEDIATELY AND MOVE TO HIGHER GROUND AWAY FROM LAKE SUPERIOR AND MUNISING BAY. THIS IS A DANGEROUS AND LIFE THREATENING SITUATION.

A LAKESHORE FLOOD WARNING MEANS THAT LAKESHORE FLOODING AND BEACH EROSION IS OCCURRING OR IS IMMINENT ALONG THE LAKE SUPERIOR

SHORELINE AROUND MUNISING BAY. STAY OFF
PIERS...DOCKS...BREAKWALLS AND BEACHES.

LISTEN TO NOAA WEATHER RADIO OR YOUR LOCAL MEDIA OUTLET FOR THE
LATEST MARINE FORECASTS AND STATEMENTS FROM THE NATIONAL WEATHER
SERVICE ABOUT THIS DANGEROUS AND LIFE THREATENING SITUATION.

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Example Coastal Flood Warning

WHUS42 KTAE 240659
CFWTLH
FLZ028-034-241400-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
COASTAL FLOOD WARNING
NATIONAL WEATHER SERVICE TALLAHASSEE FL
300 AM EDT TUE JUL 24 2001

...THE COASTAL FLOOD WARNING FOR DIXIE COUNTY HAS BEEN EXTENDED
UNTIL 10 AM EDT...

...A COASTAL FLOOD WARNING HAS BEEN ISSUED FOR TAYLOR COUNTY
UNTIL 10 AM EDT...

AT 230 AM EDT...MINOR COASTAL FLOODING HAD ALREADY BEEN OBSERVED
AT THE MOUTH OF THE STEINHATCHEE RIVER...WHICH RUNS BETWEEN DIXIE
AND TAYLOR COUNTIES. THE FLOODING IS BEING DRIVEN BY STRONG
ONSHORE WINDS EXCEEDING 30 MPH ASSOCIATED WITH AN AREA OF LOW
PRESSURE OVER APALACHEE BAY. THE WORST OF THE FLOODING CAN BE
EXPECTED AROUND THE TIME OF THE NEXT HIGH TIDE...WHICH WILL
GENERALLY OCCUR BETWEEN 530 AM EDT AND 600 AM EDT ALONG THE DIXIE
AND TAYLOR COUNTY COASTLINE. TIDES OF 2 TO 4 FEET ABOVE NORMAL
CAN BE EXPECTED...WHICH WILL CAUSE FLOODING IN LOW LYING AREAS.
CONDITIONS ARE EXPECTED TO IMPROVE BY LATE MORNING AFTER THE TIME
OF HIGH TIDE AS THE LOW PRESSURE SYSTEM MOVES INLAND OVER THE
FLORIDA BIG BEND.

A COASTAL FLOOD WARNING MEANS THAT FLOODING IS OCCURRING OR
IMMINENT. COASTAL RESIDENTS IN THE WARNED AREA SHOULD BE ALERT
FOR RISING WATER...AND TAKE APPROPRIATE ACTION TO PROTECT LIFE
AND PROPERTY. STAY TUNED TO NOAA WEATHER RADIO AND OTHER LOCAL
MEDIA FOR UPDATES.

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Example Coastal Flood Warning

WHUS41 KAKQ 100928
CFWAKQ
VAZ084-086-091-094-095-098-102000-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
COASTAL FLOOD WARNING
NATIONAL WEATHER SERVICE WAKEFIELD VA
526 AM EDT THU APR 10 2003

THE NATIONAL WEATHER SERVICE HAS ISSUED A COASTAL FLOOD WARNING
UNTIL 600 AM EDT FRIDAY MORNING FOR THE FOLLOWING AREAS...

IN VIRGINIA...

GLOUCESTER...MATHEWS...NEWPORT
NEWS/HAMPTON...NORFOLK/PORTSMOUTH...VIRGINIA BEACH AND
YORK...INCLUDING POQUOSON...

PERSISTENT NORTHEAST WINDS 25 AND 35 MILES PER HOUR...WITH
POSSIBLE HIGHER GUSTS...WILL RAISE WATER LEVELS OVER THE SOUTHERN
BAY TODAY INTO TONIGHT. THIS PROLONGED PERIOD OF ONSHORE WINDS
WILL CAUSE MINOR TO MODERATE COASTAL FLOODING AROUND THE TIME OF
HIGH TIDE THIS AFTERNOON...AND POSSIBLY AGAIN EARLY FRIDAY
MORNING.

TIDE LEVELS ARE EXPECTED TO INCREASE TO 4 TO 4.5 FEET ABOVE
NORMAL THURSDAY AFTERNOON. FOR HAMPTON ROADS...MINOR COASTAL
FLOODING BEGINS WITH A WATER LEVEL OF 5 FEET ABOVE MEAN LOWER LOW
WATER...WITH MODERATE COASTAL FLOODING BEGINNING AT 6 FEET. MORE
SIGNIFICANT...MODERATE COASTAL FLOODING IS EXPECTED AROUND THE
THURSDAY AFTERNOON HIGH TIDE. THE FOLLOWING ARE THE TIMES AND
FORECASTED LEVELS OF HIGH TIDES AT SEWELLS POINT AND VIRGINIA
BEACH...WITH THE TIDE LEVELS REFERENCED TO MEAN LOWER LOW WATER:

LOCATION	TIME OF HIGH TIDE	EXPECTED HEIGHT
SEWELLS PT	415 PM THURSDAY	6.6 FEET.
	450 AM FRIDAY	4.8 FEET.
VIRGINIA BEACH	248 PM THURSDAY	6.3 FEET.
	323 AM FRIDAY	5.1 FEET.

STAY TUNED TO NOAA WEATHER RADIO AND OTHER LOCAL MEDIA FOR
FURTHER DETAILS OR UPDATES FROM THE NATIONAL WEATHER SERVICE.
FOR ADDITIONAL WEATHER INFORMATION...YOU CAN ALSO REFER TO OUR
WEB SITE AT [HTTP://WEATHER.NOAA.GOV/AKQ](http://weather.noaa.gov/akq).

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3. Examples of Coastal/Lakeshore Flood Statements

Example Coastal Flood Statement to cancel an existing Watch or Warning

WHUS42 KJAX 161441
CFWJAX
FLZ024-025-033-038-161537-

COASTAL FLOOD STATEMENT
NATIONAL WEATHER SERVICE JACKSONVILLE FL
937 AM EST FRI NOV 16 2001

...COASTAL FLOOD WARNING CANCELED FROM FERNANDINA BEACH TO
FLAGLER BEACH...

ALTHOUGH WIND SPEEDS WILL REMAIN STRONG BETWEEN THE LOW PRESSURE
CENTER OFF THE FLORIDA EAST COAST AND HIGH PRESSURE TO THE
NORTH...THE WIND DIRECTION HAS SHIFTED TO THE NORTH. THIS HAS
SIGNIFICANTLY REDUCED THE THREAT FOR COASTAL FLOODING ALONG THE
NORTHEAST FLORIDA COAST. THEREFORE...THE COASTAL FLOOD WARNING
HAS BEEN CANCELED.

THIS IS THE LAST STATEMENT ON THIS COASTAL FLOODING EVENT.

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Example Coastal Flood Statement With Multiple Functions

WHUS41 KAKQ 010249
CFWAKQ
MDZ025-NCZ102-VAZ095-098>100-011000-

COASTAL FLOOD STATEMENT
NATIONAL WEATHER SERVICE WAKEFIELD VA
1048 PM EDT SUN SEP 30 2001

...COASTAL FLOOD WATCH CANCELLED FOR NORFOLK...PORTSMOUTH...AND
VIRGINIA BEACH...

...COASTAL FLOOD WARNING CONTINUES IN EFFECT THROUGH MONDAY
MORNING FOR THE MARYLAND BEACHES...

...HIGH SURF ADVISORY CONTINUES IN EFFECT FOR MID ATLANTIC
BEACHES FROM MARYLAND THROUGH CURRITUCK COUNTY NORTH CAROLINA...

AN INTENSIFYING LOW PRESSURE SYSTEM OFF THE MIDDLE ATLANTIC COAST
WILL PRODUCE NORTH AND NORTHEAST WINDS OF 25 TO 35 KTS
TONIGHT...WITH HIGHER GUSTS. THESE WINDS WILL PRODUCE SEAS OF 10
TO 15 FEET FROM FENWICK ISLAND DELAWARE SOUTH TO CURRITUCK BEACH

LIGHT NORTH CAROLINA...AS WELL AS GENERATE TIDES OF 2 TO 3 FEET ABOVE NORMAL IN THE CHESAPEAKE BAY FROM NEW POINT COMFORT TO CAPE HENRY...AND ALONG COASTAL AREAS FROM FENWICK ISLAND TO CURRITUCK BEACH LIGHT.

MINOR TO MODERATE COASTAL FLOODING WAS OBSERVED IN THE OCEAN CITY BAYSIDE LATE THIS EVENING AFTER THE TIME OF HIGH TIDE. HIGHER THAN NORMAL TIDE HEIGHTS WILL OCCUR AGAIN MONDAY MORNING...ESPECIALLY IN THE BAYSIDE OF OCEAN CITY...APPROXIMATELY 2 HOURS AFTER OCEAN CITY HIGH TIDE.

FOR AREAS ALONG THE SOUTHERN SHORE OF THE CHESAPEAKE BAY...THE POTENTIAL FOR MINOR COASTAL FLOODING EXISTS WITH THE HIGH TIDE MONDAY MORNING. THE THREAT FOR MINOR COASTAL FLOODING WILL BE GREATEST IN THE NORFOLK...PORTSMOUTH AND VIRGINIA BEACH AREAS.

THE TIMES AND FORECAST HEIGHTS OF HIGH TIDES FOR SOME SELECTED LOCATIONS TONIGHT. HEIGHTS ARE GIVEN IN FEET WITH RESPECT TO MEAN LOWER LOW WATER...

OCEAN CITY MD...AT 723 AM MONDAY MORNING...6.0 FT.

SEWELLS POINT...AT 912 AM MONDAY MORNING...5.0 FT.

DUCK PIER NC...AT 729 AM MONDAY MORNING...6.3 FT.

HIGH TIDE LEVELS IN ISLE OF WIGHT BAY WILL BE APPROXIMATELY 930 AM.

THE HIGHER THAN NORMAL TIDES...AND THE POUNDING HIGH SURF WILL RESULT IN SOME MINOR BEACH EROSION ALONG MID ATLANTIC BEACHES AS WELL.

STAY TUNED TO NOAA WEATHER RADIO AND OTHER LOCAL MEDIA FOR FURTHER DETAILS OR UPDATES FROM THE NATIONAL WEATHER SERVICE...OR CHECK OUR WEB SITE AT [HTTP://WWW.NWS.NOAA.GOV/ER/AKQ](http://www.nws.noaa.gov/er/akq).

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Example Lakeshore Flood Statement to Cancel Lakeshore Warning

WHUS61 KBUF 122000
CFWBUF
NYZ010-019-122100-

LAKESHORE FLOOD STATEMENT
NATIONAL WEATHER SERVICE BUFFALO NY
300 PM EST TUE DEC 12 2000

...LAKESHORE FLOOD WARNING CANCELLED...

THE LAKESHORE FLOOD WARNING THAT WAS IN EFFECT FOR THE LAKE ERIE COAST FROM DUNKIRK TO BUFFALO NEW YORK HAS BEEN CANCELLED.

THE STRONG STORM SYSTEM THAT PRODUCED SUSTAINED WESTERLY WINDS OF UP TO 60 MILES AN HOUR EARLIER TODAY OVER LAKE ERIE HAS MOVED AWAY. MINOR FLOODING NOW OCCURRING ALONG THE LAKESHORE WILL SOON ABATE AS WINDS HAVE DECREASED TO 25 TO 35 MPH AND WAVES HAVE DECREASED TO 4 TO 6 FEET. WINDS AND WAVES WILL DECREASE FURTHER TONIGHT.

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RSH

Example Coastal Flood Statement Directing Users to Hurricane Local Statements

WHUS42 KMFL 040351
CFWMIA
FLZ067-068-071>074-040451-

COASTAL FLOOD STATEMENT
NATIONAL WEATHER SERVICE MIAMI FL
1051 PM EST SAT NOV 3 2001

A HURRICANE LOCAL STATEMENT WILL BE ISSUED BY THE MIAMI FORECAST OFFICE AT 11 PM TONIGHT. EFFECTIVE AT 11 PM TONIGHT COUNTY-SPECIFIC INFORMATION ABOUT COASTAL FLOODING AND OTHER SIGNIFICANT WEATHER IMPACTS ASSOCIATED WITH HURRICANE MICHELLE WILL BE ISSUED BY THE NATIONAL WEATHER SERVICE OFFICE IN MIAMI USING A COMPREHENSIVE HURRICANE LOCAL STATEMENT. UNTIL FURTHER NOTICE SEPARATE COASTAL FLOOD STATEMENTS WILL NOT BE ISSUED BY THE NATIONAL WEATHER SERVICE OFFICE IN MIAMI.

HURRICANE LOCAL STATEMENTS WILL BE ISSUED UNDER THE WMO HEADER WTUS82 KMFL. NOAAPORT DATA USERS WILL FIND THE STATEMENTS UNDER THE HEADER HLSMIA.

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Example Coastal Flood Statement for High Surf Advisory

WHUS42 KMLB 282258
CFWMLB
FLZ047-054-059-064-141-147-291000-

COASTAL FLOOD STATEMENT
NATIONAL WEATHER SERVICE MELBOURNE FL
558 PM EST SAT FEB 28 2004

...HIGH SURF ADVISORY FLAGLER BEACH TO JUPITER INLET...

A TIGHT PRESSURE GRADIENT BETWEEN A DEPARTING GALE CENTER OFF THE SOUTHEASTERN SEABOARD...AND A LARGE HIGH PRESSURE AREA COVERING THE EASTERN UNITED STATES...WILL CONTINUE TO PRODUCE A LONG FETCH OF STRONG NORTHEAST WINDS OVER THE SOUTHWEST ATLANTIC TONIGHT. THESE WINDS HAVE GENERATED A 10 TO 12 FOOT SWELL OVER THE OPEN ATLANTIC WATERS AND LARGE BREAKERS WILL CONTINUE TO IMPACT THE EAST CENTRAL FLORIDA COAST TONIGHT.

THE POUNDING WAVES WILL CREATE DANGEROUS SURF CONDITIONS AND VERY STRONG CURRENTS AT AREA BEACHES. IN ADDITION...SOME BEACH EROSION CAN BE EXPECTED DURING THE NEXT HIGH TIDE CYCLE...WHICH WILL OCCUR BETWEEN 2 AND 3 AM SUNDAY MORNING. PEOPLE ARE ADVISED NOT TO ENTER THE WATER THIS WEEKEND DUE TO DANGEROUS CONDITIONS EXPECTED WITHIN THE SURF ZONE.

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Segmented example Coastal Flood Statement for High Surf Advisory

WHUS44 KLCH 151502
CFWLCH

COASTAL FLOOD STATEMENT
NATIONAL WEATHER SERVICE LAKE CHARLES LA
1000 AM CDT THU JUN 10 2004

LAZ053-102200-
IBERIA-
1000 AM CDT THU JUN 10 2004

...HIGH SURF ADVISORY FROM INTRACOASTAL CITY TO CYPREPOINT...

A PROLONGED PERIOD OF MODERATE ONSHORE FLOW ACROSS THE GULF OF MEXICO CONTINUES TO GENERATE SWELLS MOVING TOWARD THE LOUISIANA COASTLINE. SWELLS OF 6 TO 8 FEET WILL IMPACT COASTAL INTERESTS FROM INTRACOASTAL CITY TO CYPREPOINT.

THE SWELLS WILL CREATE DANGEROUS SURF CONDITIONS AND VERY STRONG CURRENTS AT AREA BEACHES. IN ADDITION...SOME BEACH EROSION CAN BE EXPECTED DURING THE NEXT HIGH TIDE CYCLE...WHICH WILL OCCUR BETWEEN 2 AND 3 AM FRIDAY AND SATURDAY MORNING. PEOPLE ARE ADVISED NOT TO ENTER THE WATER THIS WEEKEND DUE TO DANGEROUS CONDITIONS EXPECTED WITHIN THE SURF ZONE.

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LAZ054-102200-
SAINT MARY-
1000 AM CDT THU JUN 10 2004

...HIGH SURF ADVISORY CONTINUES ALONG THE LOUISIANA COAST FROM
CYPREMORT POINT TO MORGAN CITY...

THIS ADVISORY CONTINUES FOR SAINT MARY PARISH IN LOUISIANA.

SWELLS WILL CONTINUE TO IMPACT THIS PORTION OF THE COAST AND WILL
CREATE DANGEROUS SURF CONDITIONS.

STAY TUNED TO THE NATIONAL WEATHER SERVICE FOR THE LATEST WEATHER
INFORMATION. FOR ADDITIONAL INFORMATION...SEE THE NATIONAL WEATHER
SERVICE IN LAKE CHARLES HOMEPAGE AT [HTTP://WWW.SRH.NOAA.GOV/LCH](http://www.srh.noaa.gov/lch).

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BML

4. Example NWS Tide Report

SOUS44 KLIX 051301
TIDNEW

LOUISIANA COASTAL TIDE DATA
NATIONAL WEATHER SERVICE NEW ORLEANS LA
705 AM CST TUE FEB 05 2002

...LOUISIANA COASTAL TIDE DATA FOR...WED FEB 06 2002

CALCASIEU PASS...LIGHTHOUSE WHARF

LO	4 17 AM	STAGE	-1.2	HI	12 14 PM	STAGE	0.9
LO	6 06 PM	STAGE	0.2	HI	9 36 PM	STAGE	0.4

SHELL ISLAND...ATCHAFALAYA BAY

LO	5 15 AM	STAGE	-1.6	HI	4 10 PM	STAGE	0.2
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BARATARIA PASS...GRAND ISLE

LO	4 12 AM	STAGE	-1.1	HI	5 50 PM	STAGE	0.5
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RIGOLETS...LAKE BORGNE

LO	6 53 AM	STAGE	-0.9	HI	8 03 PM	STAGE	0.4
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SOUTHWEST PASS...MISSISSIPPI RIVER

LO	2 40 AM	STAGE	-1.2	HI	4 00 PM	STAGE	0.6
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WINE ISLAND...TERREBONNE BAY

LO	5 24 AM	STAGE	-1.2	HI	5 58 PM	STAGE	0.6
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5. Example Great Lakes Water Level Report

SXUS08 KDTX 281504
OMRDTX

GREAT LAKES WATER LEVELS
NATIONAL WEATHER SERVICE DETROIT/PONTIAC MI
1005 AM EST MON JAN 28 2002

THE FOLLOWING ARE THE MEAN LAKE LEVELS FORECAST OVER THE NEXT
WEEK.

LAKE	LEVEL... INCHES FROM CHART DATUM
SUPERIOR	1
MICHIGAN AND HURON	-2
ST CLAIR	10
ERIE	15
ONTARIO	16